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# Motorbike-Related Injuries & Safety Practices Among Motorbike Riders in Kisumu, Western Kenya in 2019

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*SIT Study Abroad*

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**Abstract**

Road traffic injuries are a growing public health problem throughout the world. Kenya has is known for having unsafe roads with an estimated 13,463 road traffic fatalities in 2016 and 24% of road traffic fatalities coming from 2-and 3-wheeled vehicles (WHO, 2018). This study sought to analyze road safety measures and road traffic injuries amongst motorbike taxi drivers in Kisumu, Kenya. A qualitative survey was administered to 152 motorbike taxi drivers in Kisumu over a two-week period in April 2019. The results were then analyzed. Results showed that 70% of drivers owned a helmet for themselves and 48.3% of drivers owned a helmet for their passenger. Regarding road traffic accidents, 57% of all drivers have been involved in an accident and 22% of all drivers have sustained a road traffic injury. The majority of motorbike taxi drivers are married men. Motorbike taxi driving is part of the informal economy in Kenya and employs many people and provides affordable transportation for many more people. It is important that safe driving skills are taught to motorbike taxi drivers as well as the importance of wearing helmets and other safety gear.

Key Words: road traffic safety, motorbikes, Kenya, helmets, injuries

**Acknowledgements**

I would like to thank all of the boda boda drivers who helped me with my research. I could not have done this project without help and support from Emily and all the other Spring 2019 students. I would like to thank my host family for letting me live with them. I especially would like to thank Anne and Josephine for being excellent Kiswahili teachers and the rest of the SIT staff. I would like to thank my project advisor George Omondi Otieno. I also would really like to thank my parents and family back in America for supporting me throughout my entire semester.

**Background**

Road traffic injuries are a major leading cause of morbidity and mortality worldwide, yet they are a severely overlooked public health problem. The World Health Organization estimates that about 1.35 million people died in 2016 from road traffic injuries while 20 to 50 million additional people sustained road traffic injuries (2018). In the year 2000, road traffic injuries were ranked the tenth leading cause of death worldwide and HIV/AIDS was listed as the seventh leading cause of death. By 2016, road traffic injuries were listed as the eighth leading cause of death throughout the world and HIV/AIDS was no longer listed in the top ten (WHO, 2018). Road traffic accidents now kill more people worldwide than malaria (WHO, 2017).

Road traffic injuries are the leading cause of death among children and adults aged 5 to 29 years old. This alarming statistic shows that road safety needs to be a priority concern in preserving child health and protecting the world's vulnerable children (WHO, 2018). Road traffic injuries and deaths severely impact people during their prime working years. Adults aged 15 to 44 make up 59% of global traffic deaths (WHO, 2013). Being injured or killed during these years of life can cause a severe economic burden on a family, community, and country. Estimates show road traffic injuries costing low-and-middle income countries between 1% and 2% of their annual GDP (WHO, 2013).

There is a disparity between high-income countries and low-and-middle income countries in regards to road traffic injuries and deaths. Some high-income countries have actively lowered their road traffic injury and death rate through prevention and education methods. Yet, many low-and-middle income countries are rapidly becoming more motorized and thus experiencing increases in road traffic injuries and deaths (WHO, 2013). The African continent holds the highest risk for dying from a road traffic injury, yet the continent is the least motorized in the world. Africa has 46.6 vehicles per 1,000 people compared to Europe, which has 510.3 cars per 1,000 people (WHO, 2015). Despite this large difference, Africa has an estimated road traffic injury fatality rate of 26.6 deaths per 100,000 people whereas Europe has an estimated 9.3 road traffic related deaths per 100,000 people (WHO, 2015).

Motorbikes are becoming especially popular in developing nations all over the world. Motorbikes tend to be more affordable than cars and provide an easier way of

navigating dense urban traffic. In Kenya, public transportation is not well developed and motorbike taxis provide a convenient and affordable transportation option for people. Motorbike taxis can be found on nearly any street corner and can drop customers off at their exact location. An important factor in the increase of motorbikes in Kenya is that in 2007 Kenya removed the import tax from motorbikes, which increased their popularity and presence (Muchira, 2016).

Other factors greatly impacting road traffic injuries are documentation of incidents and access to healthcare. Documentation of road traffic injuries and deaths is crucial to understanding the scope of the problem. Underreporting is especially problematic in regards to injuries (WHO, 2013). Depending on the severity of the injury and the location of the accident that caused the injury, documentation can be very challenging. Access to healthcare is also extremely important in the outcome of a road traffic accident. Healthcare can be inaccessible because of financial or geographic reasons. It is also important for countries to have reliable ambulance services since timeliness of care after an accident can be a huge determinant in the outcome (WHO, 2013).

Pedestrians, cyclists, and motorcyclists make up the most vulnerable road users. They also account for half of all road traffic injury related deaths worldwide. Between the years of 2013 and 2016, the number of motorbikes in the world increased by 10% (WHO 2018). Helmets are an extremely important factor in preventing injury and death in motorbike accidents. Extensive, comprehensive legislation regarding the use of helmets is crucial to ensuring that everyone wears a helmet when riding a motorbike. Kenya has a national helmet law, yet it is not strongly enforced, with the WHO ranking enforcement 3 out of 10 (2018). The WHO also estimates that only 35% of motorbike drivers and 3% of passengers wear helmets (2018). These low numbers show that the national helmet law in Kenya is not working and thus enforcement needs to be stronger to encourage more motorbike users to wear a helmet.

**Statement of Problem**

Road traffic accidents are a major problem throughout the world, especially in Africa. Kenya has notoriously dangerous roads, especially for vulnerable road users. In 2013, Kenya reported that 3,191 people died because of road traffic injuries yet the

World Health Organization estimates that there were 13,463 road traffic fatalities (2018). This is a massive difference, which could indicate that the road traffic fatality problem in Kenya is vastly underestimated and underreported. The WHO estimates that in Kenya approximately 24% of all road deaths consist of users of 2- and 3-wheeled vehicles. Road traffic injuries typically affect people in their prime working and productive years. Being injured, disabled, or killed has economic costs to the community and shows that the roads and traffic policies are not adequate. Road traffic injuries and fatalities are an extremely overlooked problem in Kenya and can be better studied and hopefully prevented.

**Justification of Independent Study Project Problem**

Road traffic injuries and fatalities are just like any other public health problem and they need to be thoroughly researched and analyzed to better understand the scope of the problem. There is a lack of information regarding the motorbike taxi drivers in Kisumu, Kenya. Research needs to be done on these motorbike taxi drivers in order to better understand and thus prevent future road traffic injuries and fatalities amongst motorbike taxi drivers in Kisumu, Kenya.

**Objectives of the Independent Study Project**

The objectives for this independent study project are:

1. To quantify motorbike-related road injuries in Kisumu, Kenya
2. Assess safety precautions of motorbike taxi drivers and pillion passengers
3. Identify potentially dangerous areas for road traffic accidents and injuries

**Literature Review**

Road Traffic Accidents Worldwide

Traffic deaths are massive problem worldwide. Around 1.35 million people are killed on the world's roads each year, compared to the 435,000 people who died of malaria in 2017 (WHO, 2018). Road traffic injuries are the 8$^{th}$ leading cause of death worldwide and the leading cause of death for children and young adults (WHO 2018). Progress is being made to reduce traffic accidents in some countries, yet many countries are not actively making strides to reduce their number of traffic injuries and fatalities. The risk of dying from a road traffic injury is 3 times higher in low-income countries than in high-income countries (WHO, 2018). Africa and South East Asia have higher road death rates than the global average (WHO, 2018). Pedestrians and cyclists, the most

vulnerable road users, make up 26% of global traffic deaths and 2-and 3-wheeled motor vehicles make up 28% of global traffic deaths (WHO, 2018).

## Road Traffic Accidents in the Low-and-Middle Income Countries in Africa

The World Health Organization created a report specifically on Road Safety in Africa. Africa has the lowest motorization rate in the world yet the highest road traffic injury fatality rate (WHO, 2015). Pedestrians make up 39% of all road deaths in Africa. This statistic shows a startling need for an awareness of and investment in safety measures to protect vulnerable pedestrians. Most countries in Africa have laws regarding road safety, such as speed limits, helmet wearing, and seat belts, but these laws are often not strongly enforced (WHO, 2015).

Africa carries a high burden for road traffic injuries and fatalities. This can cost low-and-middle income countries 3% to 5% of their annual GDP, which can significantly impact the economy (WHO, 2015). It is also estimated that approximately 675 people die each day on roads in Africa. Cars and motorization are dangerous for accidents, but they can also cause other health problems. Motorized vehicles increase air pollution, which affects everyone even if they are not near the road. Motorization also discourages walking, which is important for health. The lack of safe places to walk can also have an impact on physical health.

## The State of Kenyan Roads

The history of car ownership and the political and economic factors regarding motorized vehicles is very important in understanding the current state of Kenyan roads and road traffic fatalities. The number of serious injuries and fatal accidents on Kenyan roads tripled in the first ten years of Kenyan independence (Lamont and Lee, 2015). Kenya's public transportation industry was deregulated which has led to competition, corruption, and danger (Lamont and Lee, 2015). The majority of Kenyan roads was built between 1963 and 1975 and was funded by the World Bank. This led to a financial crisis in the 1980s. Much of Kenya's road infrastructure had to withstand decades of poor maintenance and high road traffic, which led to a deterioration of the road quality (Lamont and Lee, 2015). Roads were not repaired or rebuilt until Chinese investment in Kenya beginning in the 2000s. Cars in Kenya are also lacking in safety standards. A majority of Kenyan cars are second hand imports from Japan or other countries. There is

a shortage of replacement parts and a high need for vehicle repairs (Lamont and Lee, 2015). There is a wide variance in estimates for traffic injuries and fatalities in Kenya, but statistical methods show a 578% increase in road traffic related deaths from 1962 to 1992 (Lamont and Lee, 2015).

Road traffic injuries are a massive problem in Kenya. The World Health Organization reported 13,463 road traffic fatalities in Kenya in the year 2016 (2018). This is quadruple the amount of road traffic fatalities that the National Transport and Safety Authority of Kenya reported. This large difference in reported road traffic fatalities is due to many reasons. One reason is that the National Transport and Safety Authority has a narrow definition of a road traffic fatality- they say the person has to die at the scene of the accident to be considered a road traffic fatality (Kelley, 2018). This is extremely limiting since many people die at the hospital hours, days, or even months after a road traffic accident. Kenya also has poor data systems and collection methods (Kelley, 2018). Many road traffic fatalities are not reported to the police or the cause of death is not accurately recorded (Kelley, 2018). Kenya has a severe road traffic injury and fatality problem.

## Transportation Methods and Injuries in Kenya

In Kenya, education level and mode of transportation are closely connected. 82% of Kenyans who lack formal education walk or ride a bus for transportation, compared to 81% of Kenyans with a secondary or above education level who travel by personal car (Nantulya and Reich, 2002). The most vulnerable road users in Kenya are often the most economically disadvantaged as well. This can lead to severe challenges accessing and affording quality healthcare and treatment after a road traffic accident.

An analysis of trauma-related deaths in western Kenya showed road traffic injuries to make up 13% of all trauma-related deaths (Odhiambo et al., 2013). This study was conducted using data from verbal autopsies recorded in the Health and Demographic Surveillance System. Another study on the health burden of road traffic injuries in Kenya highlights speed, helmet use, and reflective clothing as key factors for improving road safety in Kenya (Bachani et al., 2011). Helmets and reflective clothing are important for protecting motorcyclists and making them more visible. There are numerous studies from all over the world touting the benefits of wearing helmets to prevent head injuries and

death while riding a motorbike. Helmets are useful in preventing head injuries in the event of a motorbike crash by 69% and helmets are effective at preventing death by 42% (Liu et al., 2009). Helmets only protect the head, so they do not prevent injuries to other body parts, such as the arms, legs, or abdomen.

## Motorbikes in Kenya

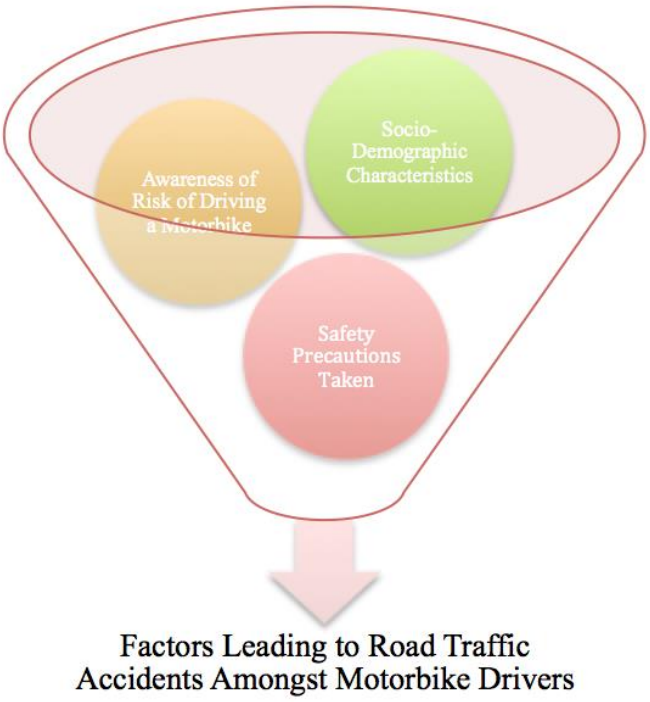
There is much literature on motorbikes in Kenya. There are 1,393,390 motorbikes registered in Kenya (NTSA, 2018). Motorbike taxis, locally referred to as 'boda bodas', are a part of the informal sector of Kenya's economy. Boda boda driving employs a large number of Kenyan men. Boda boda drivers are popular in large cities, such as Nairobi, but also popular in rural villages where they may be the only form of transportation available (Onyango, 2019). Boda bodas are important for employment and transportation, yet they do not pay taxes to the Kenyan government since they belong to the informal sector. This can cause tension between the government and boda bodas as well as simply ignoring the needs of the boda boda community (Onyango, 2019).

Motorbike injuries cause a significant health burden in Kenya. Over 20% of road traffic injuries in Kenya are caused by motorbike accidents. The majority of motorbike accident injuries impact the head and lower limbs (Saidi and Mutisto, 2013). It is recommended there be an increase in awareness in the importance of helmets and the dangers of motorbikes.

A study analyzing road traffic injuries among motorbike taxi drivers found important information regarding the types of injuries, time of crashes, and safety measures in Thika town, Kenya. The study interviewed 200 drivers who had been in a crash and found that the majority of crashes, 32%, happened during the daytime (Matheka et al., 2015). Similarly, the 38.5% of these crashes happened on paved non-highway roads (Matheka et al., 2015). This study found minor injuries to make up 38% of injuries among drivers and bruises to make up another 36% of injuries (Matheka et al., 2015). At the time of the crash, 44% of people in this study said they were wearing more than one safety item, yet 33% were not wearing any safety items (Matheka et al., 2015). Another study in Thika and Naivasha analyzed helmet use amongst motorbike drivers by doing an observational study and a survey of motorbike drivers. The observation portion of the study found that 35.12% of drivers in Thika and 37.42% of drivers in Naivasha

wore a helmet (Bachani et al., 2016). Yet the survey of drivers reported different results. The survey found that 63.1% of Thika drivers and 66.2% of Naivasha drivers responded as always wearing their helmet (Bachani et al., 2016).

**Conceptual Framework**




**Methodology for Conducting Independent Study Project**

Data was collected through a quantitative questionnaire survey. This survey was administered to motorbike or "boda boda" drivers in Kisumu Kenya. The survey was designed to be easily understood and completed in a short amount of time. The questionnaire covered safety precautions and road traffic accident prevalence. A qualitative interview of a representative of the motorbike community was conducted.

**Ethical Considerations for Conducting Independent Study Project**

There are always many ethical considerations when conducting any research project. It is very important to consider all aspects of a research project and how it will affect the local community. The researcher obtained consent from the survey participants. The survey was in English and Kiswahili and was translated with help from language

teachers. The survey was brief and on paper. The researcher contained written consent from the interviewee.

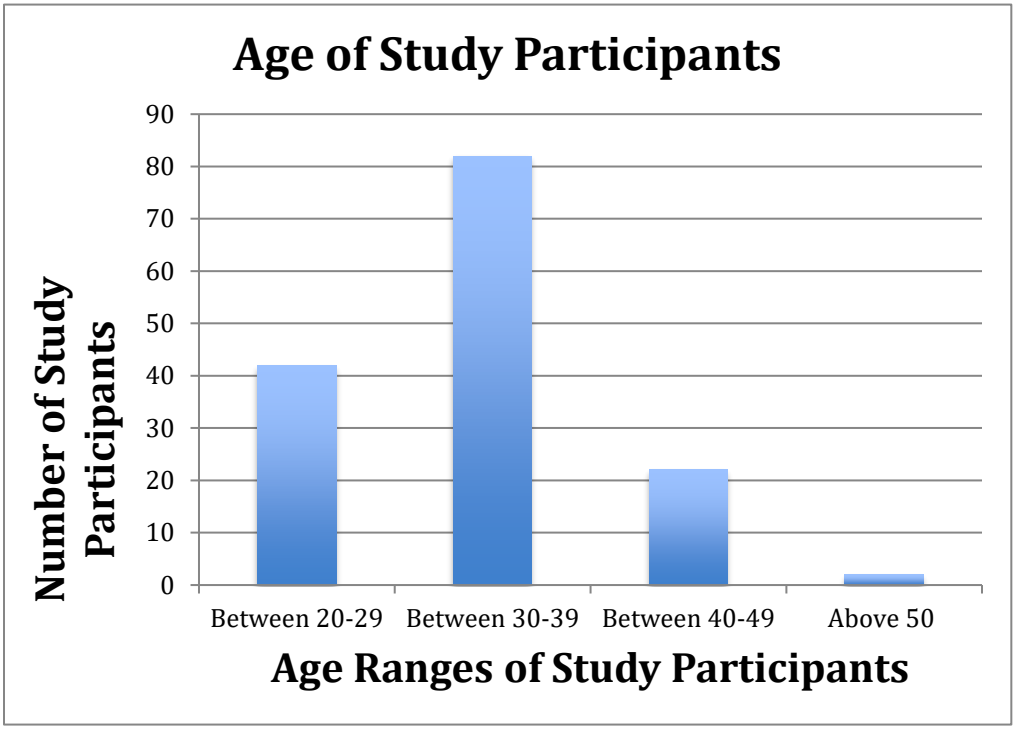
**Data Analysis**

The results from the survey are displayed below in the following sections.

**Demographics**

The demographics portion of the survey asked questions regarding age, sex, education, marital status, and residency.

**Age**



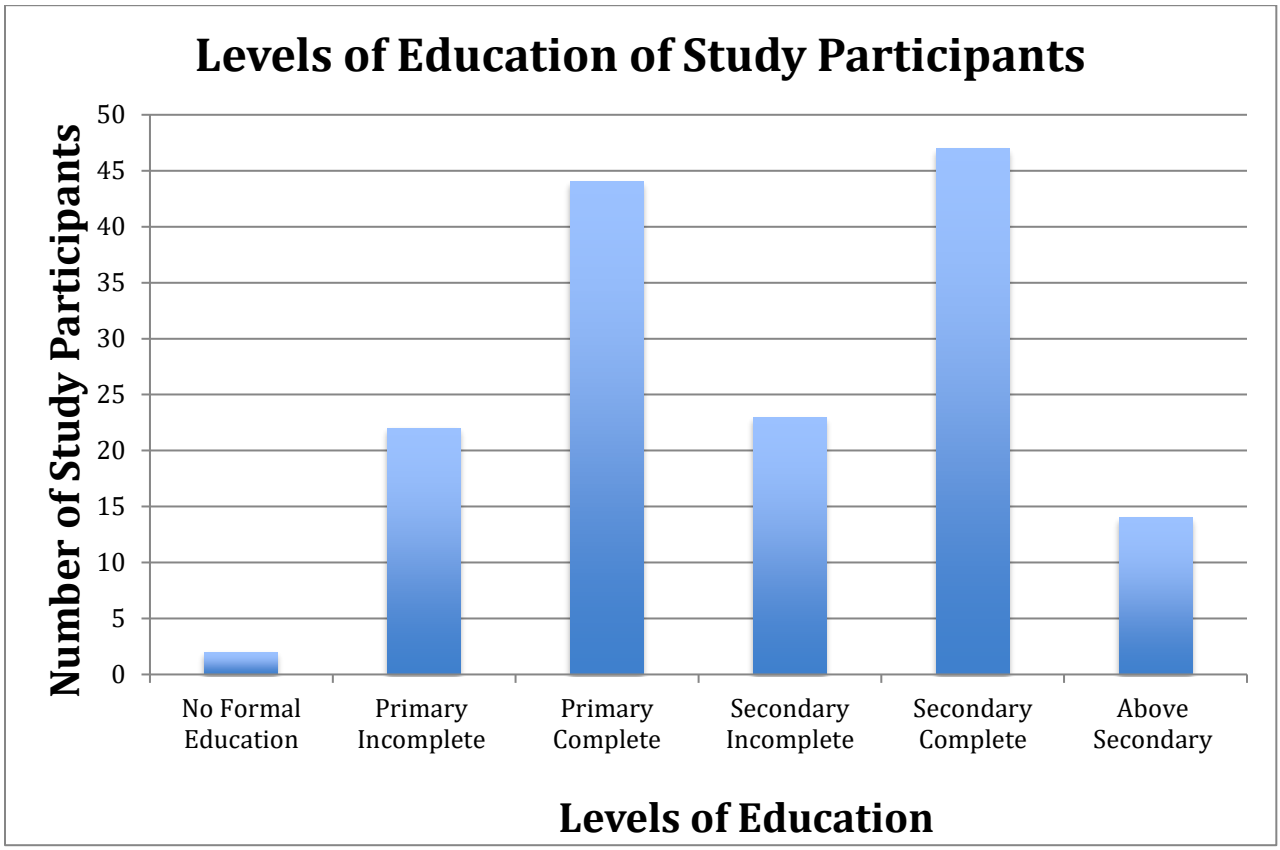

Of the 152 respondents of the survey, 148 answered the age question. The majority of respondents, 82 people (55.4%), were between the ages of 30 and 39. The second most frequent age category was between 20 and 29 with 42 (28.4%) respondents. There were 22 (14.9%) drivers who were between the ages of 40 and 49. Only 2 (1.4%) drivers were over 50 years old. There were no drivers who marked their age as below 20 years old. The ages of the drivers ranged from 21 to 63 years of age.

**Gender**

| | |
|---|---|
| Male | 152 (100%) |
| Female | 0 (0%) |

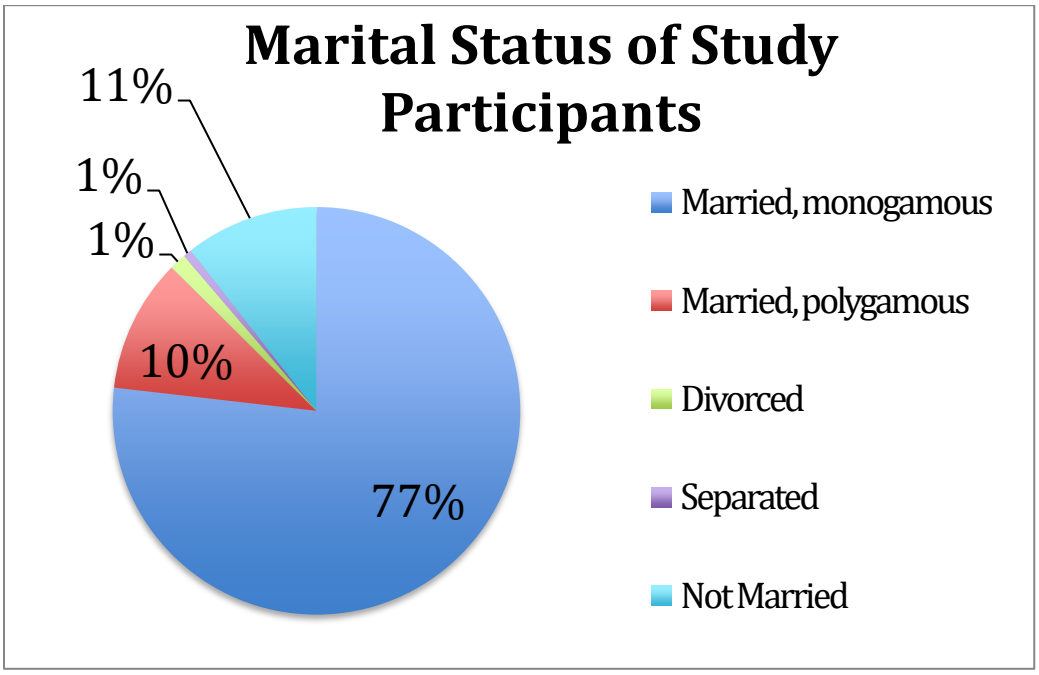
100% of the drivers who completed the survey marked themselves as male.

**Education**




All 152 respondents answered this question about the highest level of education obtained. Those with no formal education numbered 2 (1.3%) out of the total 152. 22 (14.5%) respondents did not complete primary education. 44 (28.9%) respondents completed primary school. 23 (15.1%) respondents did not complete secondary school. 47 (30.9%) respondents completed secondary school. 14 (9.2%) respondents obtained an education above secondary school.

**Marital Status**




151 out of 152 respondents answered this question. 116 (77%) respondents were in a monogamous marriage. 16 (10%) respondents were in polygamous marriage. 2 (1%) respondents were divorced. Only 1 (~1%) respondent was separated. 16 (11%) respondents were single or not married.

**Area of Residence**

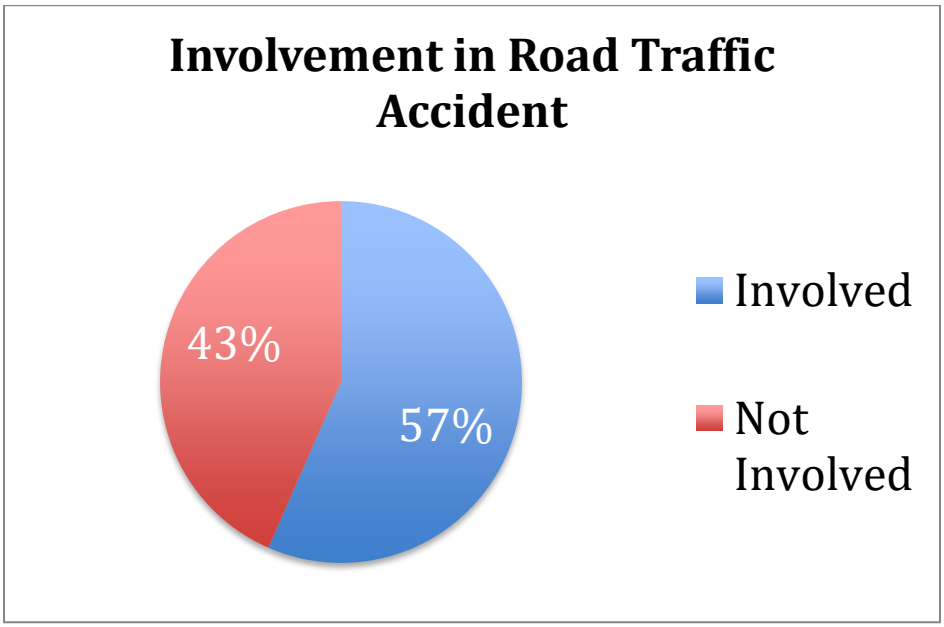
| | |
|---|---|
| Urban | 111 (73.8%) |
| Rural | 25 (16.3%) |
| Peri-Urban | 15 (9.8%) |

Of the 151 responses to this question, 111 (73.8%) respondents live in an urban area. 25 (16.3%) respondents live in a rural area. 15 (9.8%) respondents live in a peri-urban area-between urban and rural.

**Motorbike Crashes and Related Injuries**

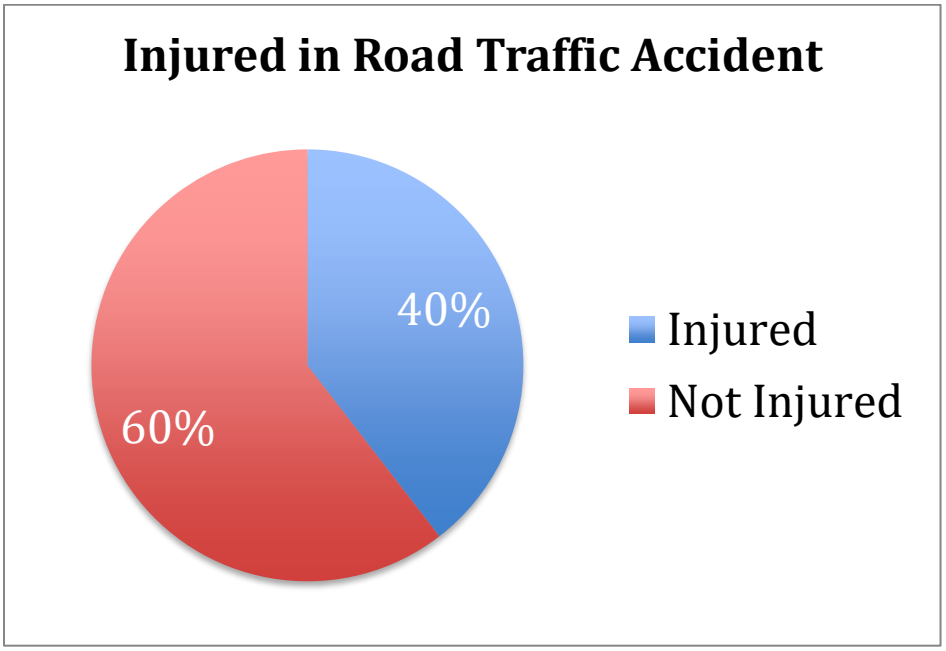
The respondents were asked questions regarding motorbike crashes and injuries involving themselves and others. The results are displayed below.

**Involvement in Motorbike-related Crash**



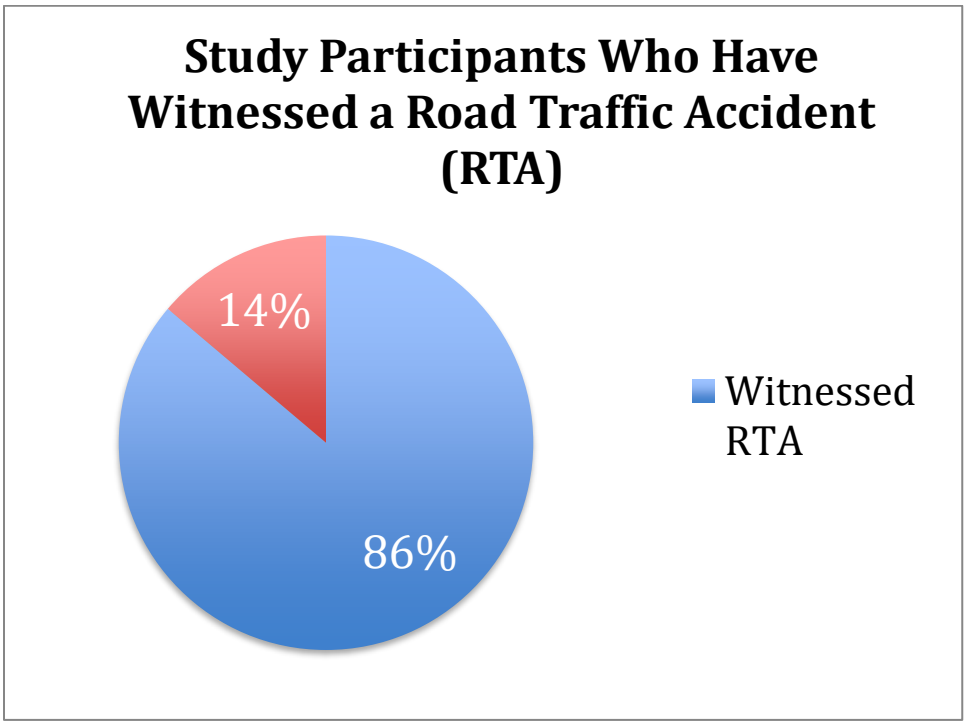

All 152 respondents answered this question. 86 (57%) respondents have been involved in some type of crash. 66 (43%) respondents have not been involved in a crash with their motorbike.

**Sustained Injury in Crash**



Of the 86 respondents involved in a motorbike crash, 34 (39.5%) respondents sustained an injury in the crash. 52 (60.5%) people involved in a crash were not injured in a motorbike crash.

**Witness a Road Traffic Accident**




All 152 respondents answered this question. 131 (86%) respondents have witnessed another motorbike crash. 22 (14%) respondents have not witnessed another motorbike crash.

**Crashes Occurring in this Area**

| | |
|---|---|
| Every Day | 57 (38.5%) |
| Every 2 Days | 17 (11.5%) |
| Weekly | 43 (29.1%) |
| Monthly | 31 (20.9%) |

148 respondents answered this question regarding how often crashes occur in the area. 57 (38.5%) respondents report witnessing crashes occurring every day in the area. 17 (11.5%) respondents report witnessing crashes occur every 2 days in the area. 43 (29.1%) respondents report crashes occurring weekly and 31 (20.9%) respondents report crashes occurring monthly in the area.

**Major Causes of Motorbike Accidents**

Study participants were asked questions regarding the causes, locations, and time of motorbike accidents. They were also asked questions regarding safety measures.

**Where Most Crashes Occur**

| | |
|---|---|
| City Roads | 37 (24.3%) |
| Residential Roads | 1 (0.7%) |
| Randomly | 114 (75%) |

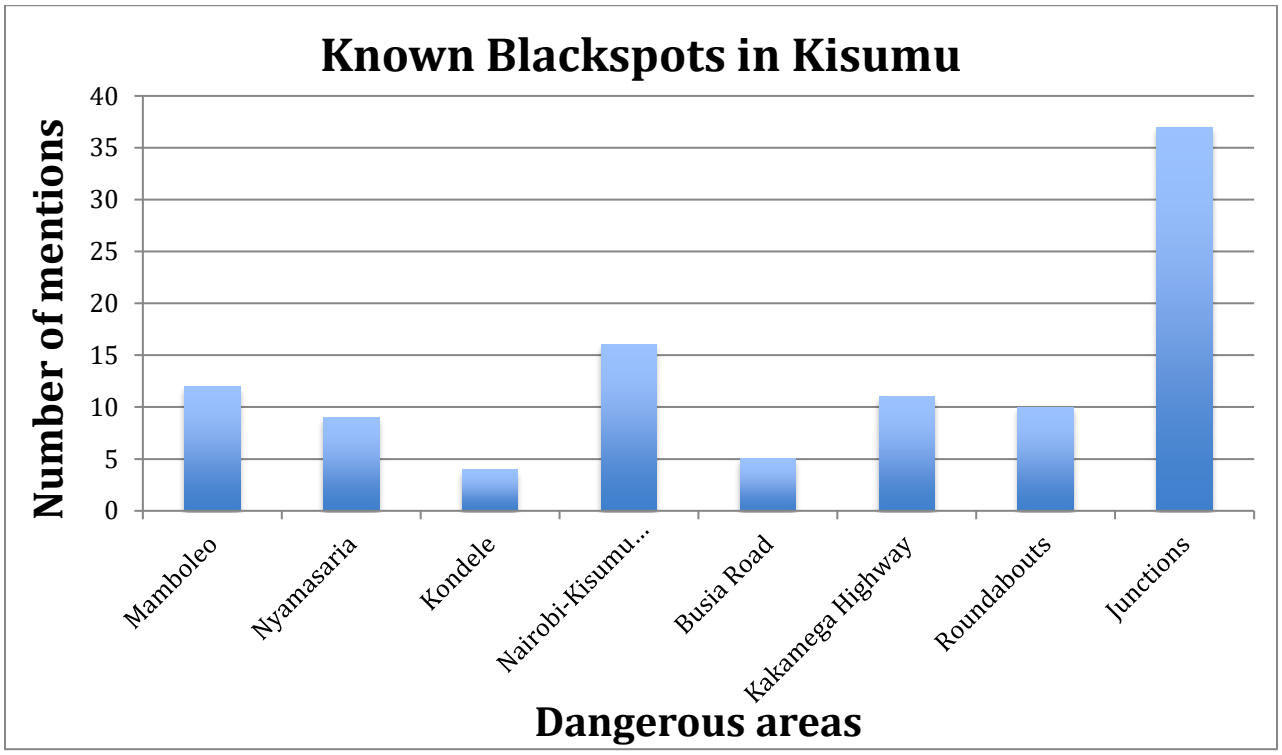
152 respondents answered this question. 38 (24.8%) respondents said that most crashes occur on city roads. Only 1 (0.65%) respondent said the most crashes occur on residential roads. The majority, 114 (74.5%), reported most crashes occurring randomly, on either city or residential roads.

**Known Accident Blackspots**

| | |
|---|---|
| Yes | 130 (86.1%) |
| No | 21 (13.9%) |

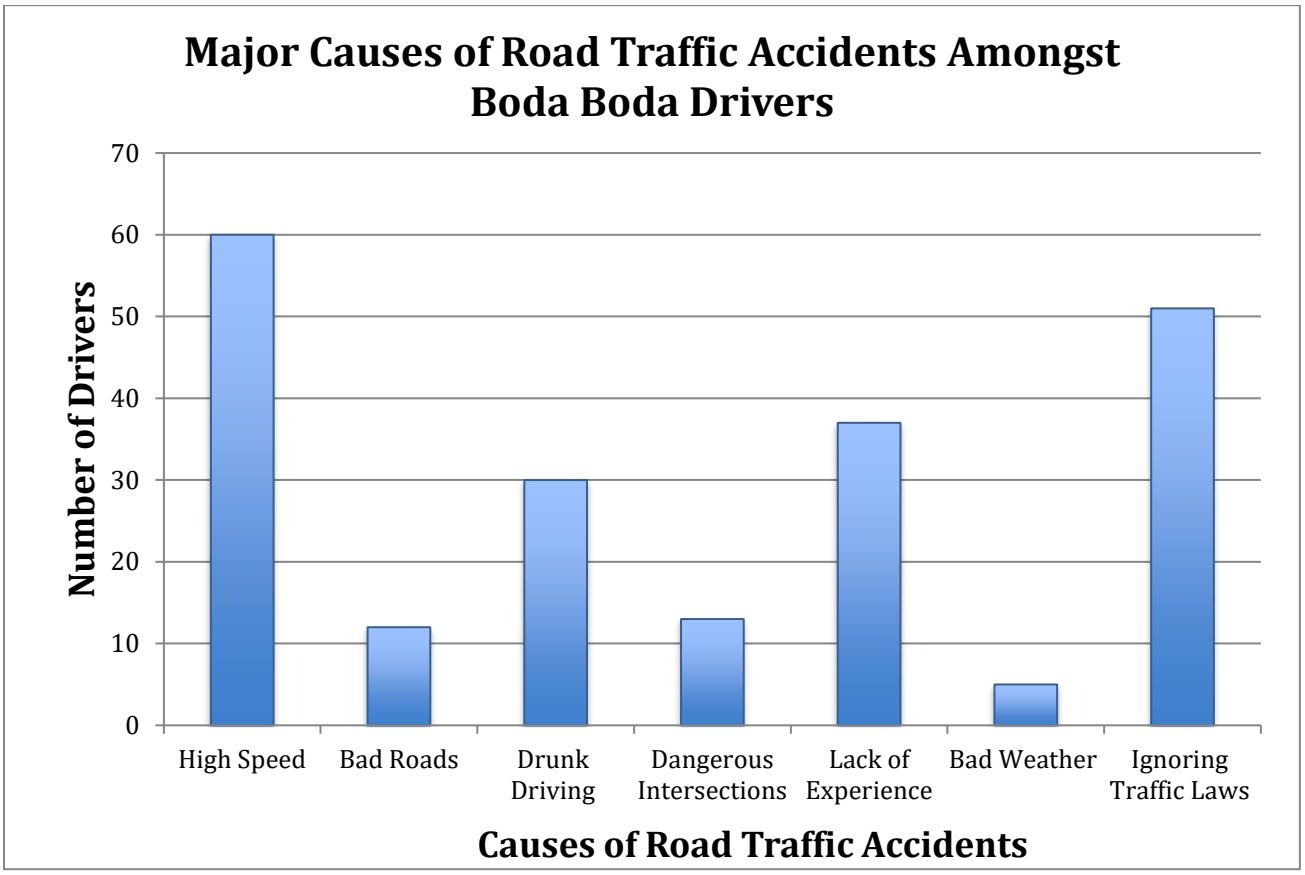
151 respondents answered this question regarding known accident blackspots- dangerous areas for traffic accidents- in Kisumu. 130 (86.1%) respondents reported being aware of areas prone to traffic accidents. 21 (13.9%) respondents reported not being aware of areas prone to traffic accidents.

**Blackspots**



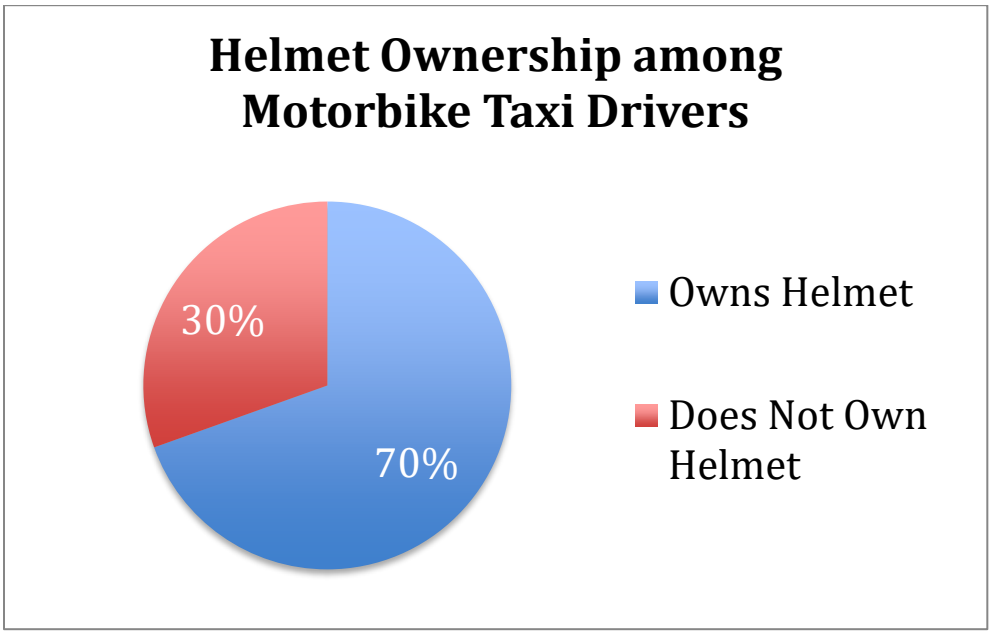

The study participants were asked to write down places in the Kisumu area that they know to be dangerous. There were a wide variety of responses, but the most common responses were counted and displayed in the chart above. Junctions, or intersections, were most the common response being mentioned 37 times. The second most frequently mentioned place was the Nairobi-Kisumu Highway with 16 mentions. Mamboleo received 12 mentions, Kakamega Highway received 11 mentions, and Nyamasaria received nine mentions. General roundabout received 10 mentions, Busia Road received five mentions, and Kondele received four mentions.

**Main Cause of Accidents**



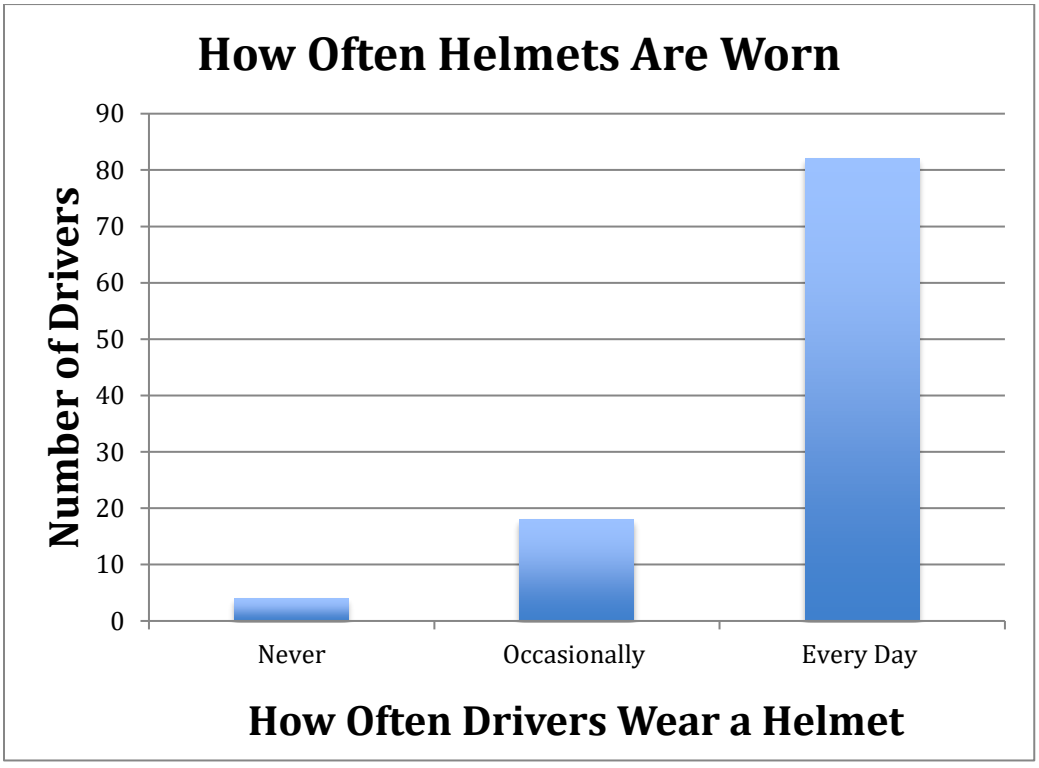

This question asked the survey participants what they felt is the main cause of traffic accidents. They were given seven options to choose from and numerous participants chose more than one answer. The responses are listed in order of how many responses each option received. High speed, ignoring traffic laws, and lack of driving experience were marked the most often, ranking from first to third place, respectively. Drunk driving and dangerous intersections received the fourth and fifth most votes. Bad roads and bad weather were marked the least often and ranked sixth and seventh place, respectively.

**Helmet Ownership**




This question asked respondents if they owned a helmet or not and 151 respondents answered this question. 105 (70%) respondents reported owning a helmet and 46 (30%) respondents reported not owning a helmet.

**Wearing a Helmet**



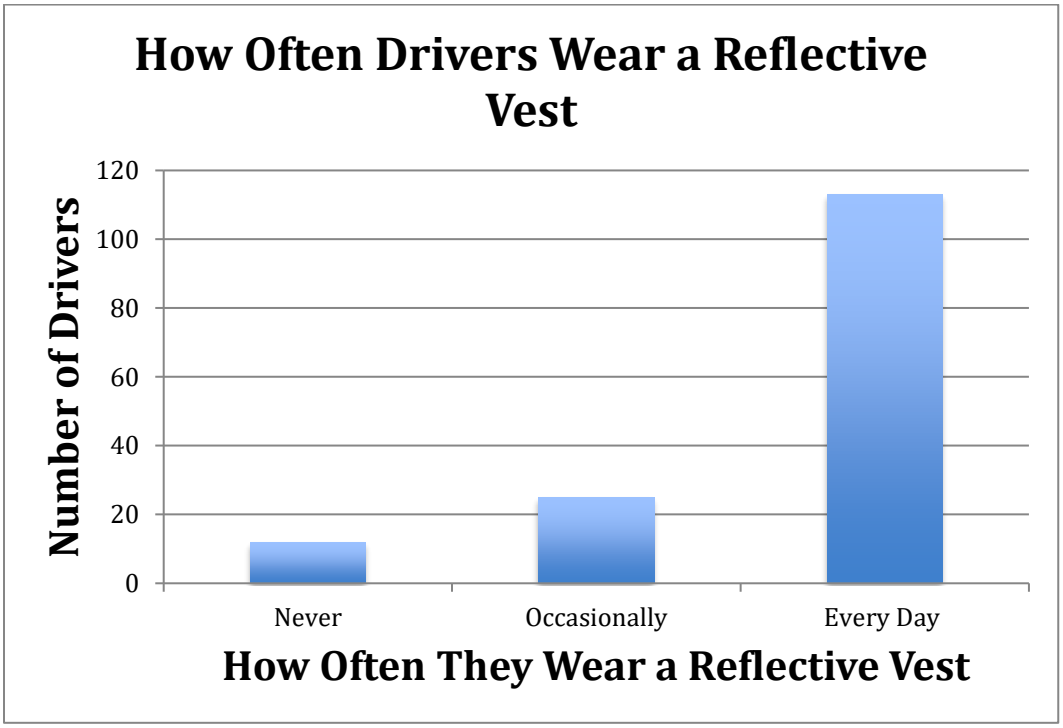
If someone responded yes to owning a helmet, then this question asked how often that respondent wore a helmet. 104 out of 105 helmet owners answered this question. 4 (3.9%) of the helmet owners responded saying they never wore their helmet. 18 (17.3%) respondents said they occasionally wore their helmet. 82 (78.8%) helmet owners answered that they always wore their helmet.

**Owning a Passenger Helmet**

| | |
|---|---|
| Owns Passenger Helmet | 73 (48.3%) |
| Does Not Own Passenger Helmet | 78 (51.6%) |

The study participants were asking whether or not they owned a helmet for their passengers and 151 responses were recorded for this question. 73 (48.3%) respondents answered yes to owning a passenger helmet and 78 (51.6%) respondents answered no to owning a passenger helmet.

**Wearing a Reflective Vest**




150 respondents answered the question asking the frequency of how often they wore a reflective vest while driving a motorbike. 12 (8%) respondents answered that they never wore a reflective vest, while 25 (16.7%) respondents answered that they occasionally wore a reflective vest. 113 (75.3%) respondents answered that they wore a reflective vest every day.

**Carrying More Than One Passenger**

| | |
|---|---|
| Carries More Than One Passenger | 79 (53%) |
| Does Not Carry More Than One Passenger | 70 (47%) |

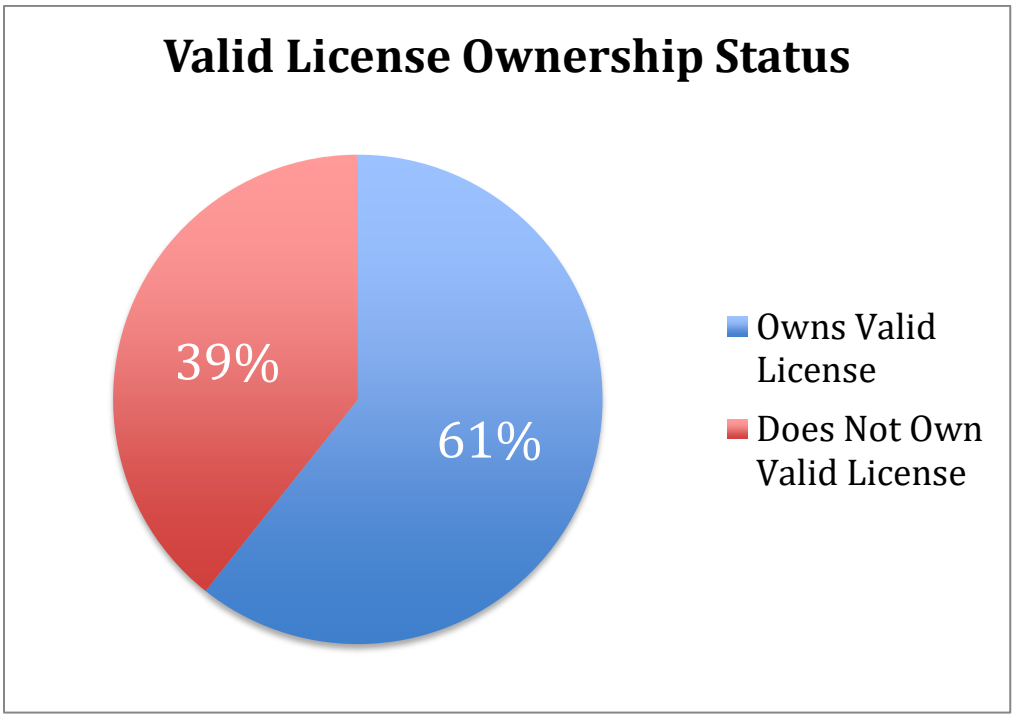
This question asked study participants if they ever carried more than one passenger on their motorbike and 149 of the study participants answered this question. 79 (53%) of the respondents carry more than one passenger on their motorbike while 70 (47%) of the respondents do not carry more than one passenger on their motorbike.

**Drunk Driving**

| | |
|---|---|
| Has Driven Drunk | 18 (12%) |
| Has Not Driven Drunk | 133 (88%) |

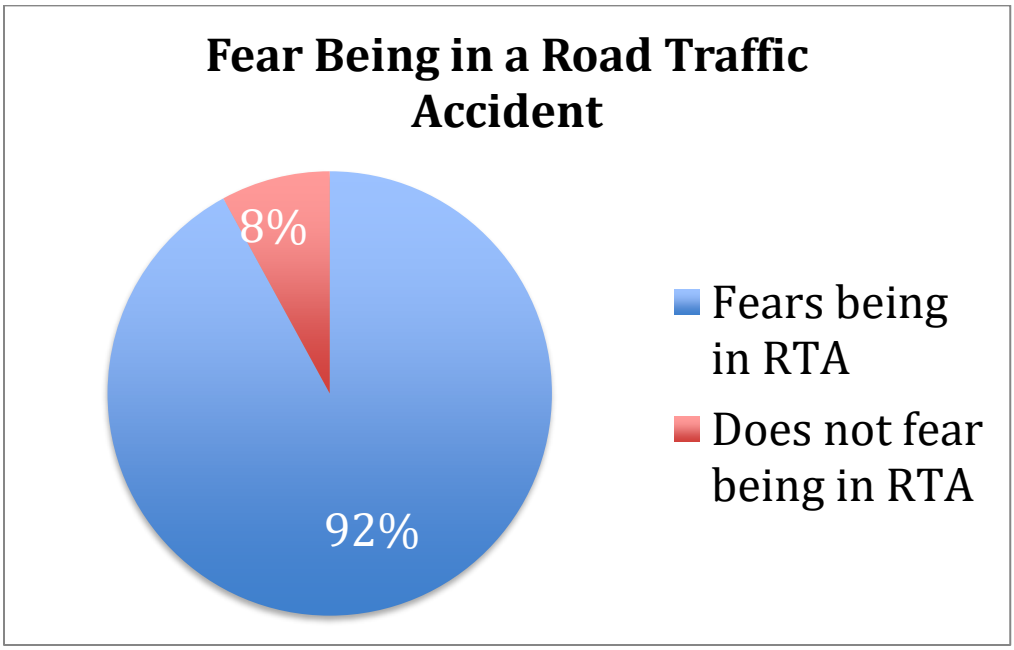
151 respondents answered the question asking if they had ever driven drunk before. 18 (12%) of the respondents said they have driven drunk before. 133 (88%) respondents said they have never driven drunk before.

**Valid Driving License**



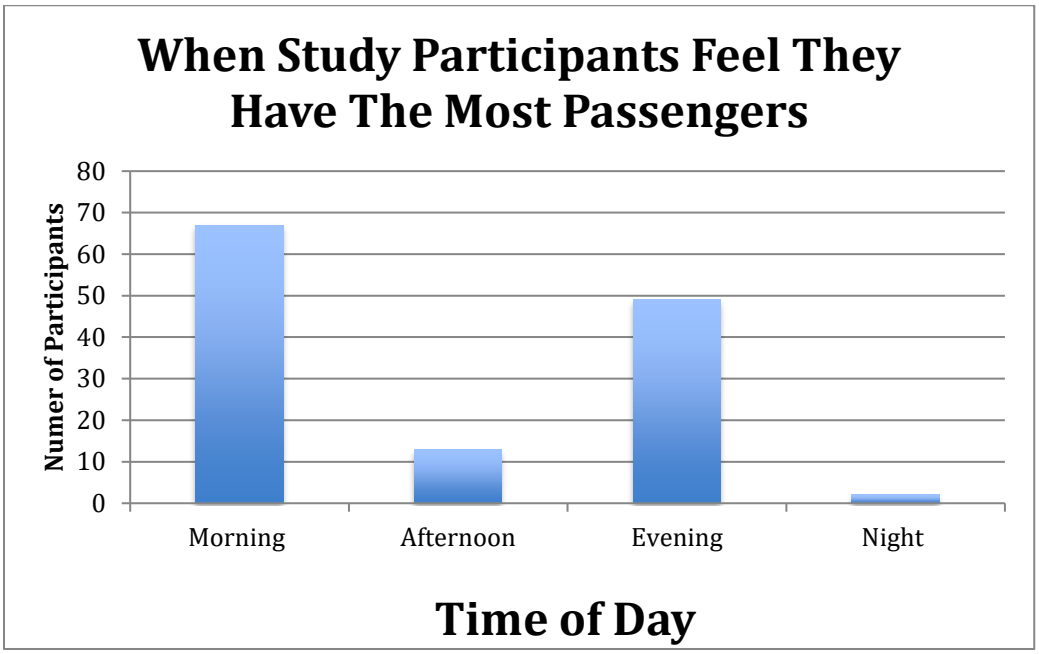

Only 145 respondents out of 152 answered this question, which asked whether or not they owned a valid driving license. 88 (61%) respondents own a valid driving license. 57 (39%) respondents do not own a valid driving license.

**Fear Being in a Road Accident**



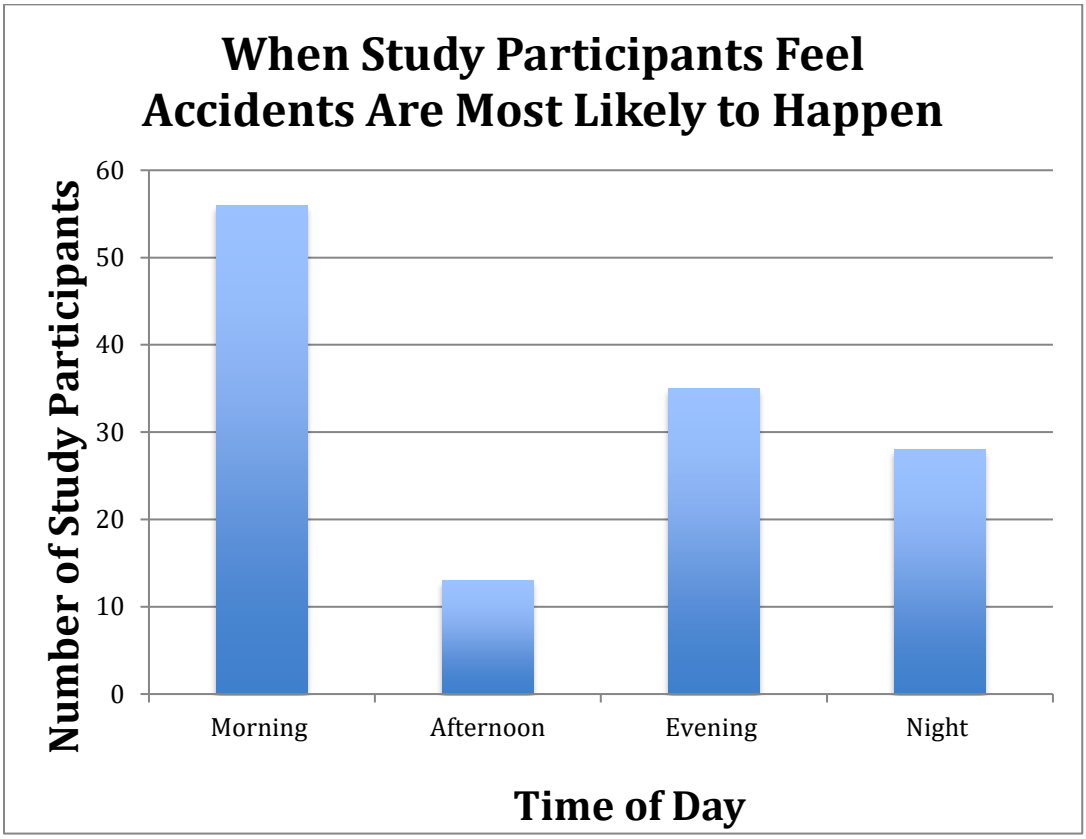

All 151 study participants answered this question asking if they feared being in a road traffic accident. 139 (92%) respondents said they do fear being in a road traffic accident and 12 (8%) of respondents said they do not fear being in an accident.

**Most Passengers**



The study participants were asked what time of day they had the most passengers and they were given the options of morning, afternoon, evening, and night. Many study participants marked multiple answers so the answers are listed in order of how many responses they received. Morning received the most responses and evening received the second most responses. Afternoon received the third most responses and night received the fewest responses.

**Accidents Most Likely to Occur**




The study participants were asked what time of day did they think accidents occurred the most. They were given the options of morning, afternoon, evening, and night and many of the study participants chose more than one answer. Morning received the most answers, evening received the second most answers, night received the third most answer, and afternoon received the fewest answers.

**Discussion**

The results of this study include data on road traffic accidents, related injuries, and safety practices of motorbike taxi drivers in Kisumu, Kenya. All of the study participants were men. Nearly all of the drivers, 98.7%, are under the age of 50 and thus

are in their most productive working years (OECD). This is crucial to note since it means being a motorbike taxi driver is supporting these men, and thus their families, throughout the main years of their lives. The majority of these drivers, 87.4%, were married. When interviewing an important representative within the motorbike taxi industry, he spoke about the drivers' families and said:

*They have families after all… They have students in secondary schools. They have pupils in primary schools, not one or two, by the way.*

Since the majority of motorbike taxi drivers are married, they most likely have or will have children to support. As of 2016 the World Bank listed the birth rate in Kenya at 3.852 births per woman. This is the lowest rate in East Africa, yet it is much higher than more developed nations (Alushula, 2018). These motorbike taxi drivers are responsible for providing for the next generation of Kenyans, so it is crucial that the government and general population of Kisumu do not overlook the health, safety, and importance of motorbike taxi drivers.

Many of the motorbike taxi drivers became drivers due to lack of employment options. 59.8% of the study participants had not completed secondary school. Many of the drivers left school for varying reasons, and the representative of the motorbike taxi community said:

*The only easy way he can get something from the table so that family can eat is that he gets a motorcycle or a motorbike and he becomes a rider*

Being a motorbike taxi driver is part of the informal economy in Kenya. It is very easy to become a motorbike taxi driver, all one has to do is buy a motorbike. This is an especially alluring career path to those who have not completed their education and need to begin working immediately.

Road traffic accidents are a major health concern regarding motorbike taxi drivers. This study found that 56.6% of motorbike taxi drivers have been involved in a crash and 39.5% of those drivers were injured in a crash. This shows that 22% of all motorbike taxi drivers have been injured in a road traffic accident. Approximately one out of five drivers have been injured in a crash and these drivers are mostly married men in their most productive working years. These crashes and injuries can have a significant economic impact on the driver, their families, and the overall communities. Injuries in

road traffic accidents can lead to medical bills and time off work, which can create economic instability. In addition to being involved in a road traffic injury, many study participants, 86.2%, have witnessed a road traffic accident.

Knowing the locations of road traffic accidents is important in understanding and hopefully preventing future road traffic accidents. The study participants were asked if they felt road traffic accidents occurred mostly on city roads, rural roads, or occurred randomly, and 75% of the study participants responded saying they felt accidents occurred randomly. The majority, 86.1%, of respondents said they were aware of accident 'blackspots' or dangerous area. Some of the most common areas listed include: Nairobi-Kisumu Highway. Kakamega Highway, Mamboleo, Nyamasaria, and Kondele. Junctions, or intersections, were listed as the most dangerous areas for traffic. Some junctions were named, such as Mamboleo junction, but mostly people wrote only junctions, referring to any and all junctions in the area. Road traffic accidents occurring at intersections is not surprising since that is where motorized vehicles from several different directions meet and cross paths.

The cause of road traffic accidents is important in understanding why the accident happened and how to prevent future accidents. The study participants were given seven options for causes of road traffic accidents and asked to mark the main cause of accidents. High speeds received the most marks and ignoring traffic laws received the second most marks. These are both interrelated causes and many study participants felt that ignoring traffic laws caused all road traffic accidents. High speeds and ignoring traffic laws can also be due to lack of proper training and awareness of road safety. The representative of the motorbike taxi community said many drivers do not attend driving school:

*Due to, most of them, lack of finances….but they are very eager to go there*

Inability to attend driving school due to finances is causing many motorbike taxi drivers to be transporting themselves and other people with little training or knowledge of proper motorbike safety measures and road rules. It is very important these drivers are properly trained on how to drive safely to prevent accidents and why driving the speed limit and following traffic rules are important. Reducing this barrier between motorbike taxi drivers and driving school is important to preventing traffic accidents. In addition to

driving school, obtaining a valid driving license is very important. This study found that 39% of motorbike taxi drivers do not have a valid driving license. Driving without a valid license is illegal in Kenya, thus these unlicensed drivers are more at risk of legal trouble. A person also has to pass a competency test to obtain a driving license in Kenya.

Another cause of accidents is driving while under the influence of alcohol. Study participants were asked if they had ever driven while under the influence of alcohol and 12% of respondents answered yes. This is a sensitive question and many of the study participants may have felt uncomfortable answering this question, so the actual number of people who have driven drunk may be higher. When discussing drunk driving and motorbike taxi drivers, the representative of the motorbike taxi community said:
*Most of us…they do overdrink, you see…it has also caused a lot of accidents*
He then went on to reference cheap, illegal alcohol from Uganda as being very popular amongst drivers. Kenyan law states that driving under the influence of drugs or alcohol is illegal if the driver is "incapable of having proper control of the vehicle" (National Council for Law Reporting-Kenya Traffic Act No. 38, 2012). Drunk driving is an illegal offense that can cause injury or death to the driver, passenger, or another individual involved in the crash.

Kenyan law and opinion has shown to be more relaxed around drunk driving than other countries. In February 2019, a Kiambu Court ruled "drunk driving is not an offence as long as the driver is in control of the vehicle" (Walter, 2019). This ruling was

An important factor in preventing injuries in road traffic accidents is the use of helmets for both the driver and passenger. The majority, 70%, of drivers said they owned a helmet yet that means that the remaining 30% of motorbike taxi drivers do not own a helmet, which is a large proportion of drivers. Helmets are very important in preventing head injuries in road traffic accidents. Head injuries can be fatal or severely damaging and can cause numerous problems to an individual and their family. Kenya does have a law requiring motorbike drivers to wear a helmet, yet that law is loosely enforced in Kisumu. Drivers felt that helmets were uncomfortable to wear and very hot. One driver even said that helmets caused accidents because helmets make it hard to hear. The cost of helmets was also said many times to be a limiting factor in helmet ownership.

Passenger helmets are also very important in preventing road traffic injuries and fatalities in the event of a road traffic accident, yet 51.6% of drivers do not own a passenger helmet. This question received many comments from the study participants. Many people said they owned a passenger helmet, but passengers always declined to wear it, so they just left the extra helmet at home. Many passengers do not want to wear helmets because they fear the helmet being dirty from multiple passengers using it. Drivers said that bigger cities such as Nairobi and Kigali had helmets that passengers used, but Kisumu is a small town and people are not as open to the passenger helmet. This lack of passenger helmet ownership and use is extremely noteworthy. It shows that the passengers of Kisumu need to be made aware of the importance of wearing a helmet on a motorbike taxi, whether they choose to buy their own helmet or wear one provided to them by their motorbike taxi driver.

Study participants listed having most passengers and when accidents are most likely to occur as both being in the morning. This is likely due to the morning rush of people needing to travel to work or school. The results from the questions asking about time of day for most passengers and traffic accidents were similar except nighttime was chosen many more times for accidents occurring than for having the most passengers. Accidents occurring at nighttime could be caused by low visibility due to lack of lighting.

**Conclusion**

There is much room for growth regarding road traffic safety amongst motorbike taxi drivers in Kisumu, Kenya. This independent study project surveyed 152 motorbike taxi drivers in Kisumu, Kenya to better understand health problems regarding road traffic safety of the community. The importance of safety gear, such as helmets, needs to be relayed to drivers and passengers. Road traffic accidents and injuries are common in Kisumu, with 57% of all drivers having been involved in an accident and 22% of all drivers having been injured in a road traffic accident. The health and safety of these drivers are important to the community. Motorbike taxi driving employs mainly working age, married men, so injuries can affect them and their families tremendously.

Road traffic accidents are a growing problem throughout the world and especially in developing nations. There were an estimated 13,436 road traffic fatalities in Kenya in 2016 (WHO). Road traffic accidents, injuries, and fatalities are massive, yet overlooked,

problem in Kenya and other developing nations. Road traffic injuries can have a severe impact on the health systems of a country and on individual communities and families.

**Recommendations**

There are many recommendations based on the results of this study. The researcher recommends educating the motorbike taxi drivers and passengers on the importance of helmets and other safety gear. The researcher recommends driving school be made more accessible to people who want to become motorbike taxi drivers. The researcher recommends there be more safety precautions in place on roads to prevent accidents, such as clear road markings, stop signs, and streetlights to provide visibility during the night.

The researcher also recommends there be more recognition and dialogue between the motorbike taxi drivers of Kisumu and the local government of Kisumu. Motorbike taxi driving employs many citizens of Kisumu and transports a large number of people, so it is important that the local Kisumu government understands the needs and challenges of the motorbike taxi community. There should also be much more research done on motorbikes in Kisumu as well as more research conducted on all forms of road traffic safety, including personal vehicle, public transportation, and pedestrian safety.

**Limitations of the Study**

The largest limitation of this study was time. The researcher was only given one month to collect and analyze data. This short time frame limited the amount of completed surveys that could be obtained. Another limitation was the sensitive nature of some of the questions. Some questions asked about illegal behavior, such as driving while intoxicated, and the study participant may have not wanted to answer such questions. The surveys were given to drivers on the street and the drivers would usually fill them out while discussing with fellow drivers or other friends. This discussion of the questions and answers may have affected how they answered the questions. This study did not offer any compensation for the participants' time, so many people turned down the survey when they realized there would be no financial reward. The study participants were left to define the word "accident" on their own terms based on if they felt they had been in a road traffic accident. This led to a wide range of road traffic incidents being classified as

an accident. The drivers were not asked to specify the details of their road traffic accident.

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Appendix A.

Motorbike Driver Questionnaire

**SECTION ONE: INDIVIDUAL SOCIO-DEMOGRAPHIC CHARACTERISTICS**

Participant No. _____ Date _____

1. Age of the respondent ___ ___ years

2. Sex
   1= Male
   2= Female

3. What is the highest level of education that you attained?
   1= No formal education
   2= Primary incomplete
   3= Primary complete
   4= Secondary incomplete
   5= Secondary complete
   6= Above secondary

4. Current marital status:
   1= Married monogamy
   2= Married polygamy
   3= Divorced
   4= Separated
   5= Single

5. Area of residence:
   1= Urban
   2= Rural
   3= Peri-urban

**SECTION TWO: MOTORBIKE-RELATED INJURIES**

6. Have you ever been involved in a crash?
   1=Yes
   0=No

7. If yes, did you sustain a serious injury in that crash?
   1=Yes
   0=No

8. Have you ever witnessed another motorcycle crash?
   1=Yes
   0=No

9. How often do motorbike crashes happen in this area?
   1= Every day
   2= Nearly after 2 days
   3=Weekly
   4= Monthly

**SECTION 3: MAJOR CAUSES OF MOTORBIKE ACCIDENTS**

10. In your opinion, where do you think most motorbike crashes happen?
    1= On city roads
    2= On residential roads
    3= Occur everywhere (randomly)

11. Are there known accident blackspots?
    1=Yes
    0=No

12. If yes, which areas are considered blackspots?

    _____

    _____

    _____

13. What do you feel is the main cause of motorcycle accidents?
    1=High speeds
    2=Bad roads
    3=Impaired driving (drunk)
    4=Dangerous intersections
    5=Lack of driving experience
    6=Weather
    7=Ignoring traffic laws

14. Do you own a helmet?
    1=Yes
    0=No

15. If yes, how often do you wear a helmet?
    1=Never
    2=Occasionally/few times a week

3= Every day

16. Do you own a helmet for your passenger?
    1= Yes
    0= No

17. How often do you wear a reflective vest?
    1=Never
    2=Occasionally/few times a week
    3= Every day

18. Do you ever have more than one passenger on your bike at a time?
    1=Yes
    0=No

19. Have you ever driven your motorcycle drunk?
    1=Yes
    0=No

20. Do you have a valid motorcycle license?
    1=Yes
    0=No

21. Do you fear being in a road accident?
    1= Yes
    0= No

22. When do you have the most passengers?
    1= Morning
    2= Afternoon
    3= Evening
    4= Night

23. As a driver, when do you feel accidents are most likely to occur?
    1= Morning
    2= Afternoon
    3= Evening
    4= Night

Appendix B.

Motorbike Driver Questionnaire

**SECTION ONE: INDIVIDUAL SOCIO-DEMOGRAPHIC CHARACTERISTICS**

Mshirika wa kwanza_____ Tarehe _____

1. Age of the respondent Umri wa mhojiwa Years__Miaka

2. Jinsia.
   1= Mwanamume.
   2= Mwanamke.

3. Una kiwango gani cha masomo?
   1= Sikusoma
   2= Sikumaliza shule ya msingi
   3= Nilimaliza shule ya msingi
   4= Sikumaliza shule ya sekondari
   5= Nilimaliza shule ya sekondari
   6= Kiwango cha juu kupita sekondari

4. Maisha ya ndoa
   1= Nimeolewa (Mume mmoja)Nimeoa(Mke mmoja)
   2= Nimeoa (wake wengi)
   3= Nimetaliki/Nimetalikiwa
   4= Tumeachana
   5= Niko peke yangu

5. Makazi
   1= Mjini
   2= Mashambani
   3= Maeneo ambayo yako karibu na miji

**SEHEMU YA PILI: MAJERAHA YANAYOHUSIANA NA BODABODA**

6. Umewahi husika kwenye ajali?
   1= Ndiyo
   0= Hapana

7. Ikiwa ndiyo ulipata jeraha kubwa?
   1= Ndiyo
   0= Hapana
8. Je umewahi shuhudia ajali ya bodaboda ingine?

1= Ndiyo
0= Hapana

9. Je ajali za bodaboda hutendeka mara ngapi katika eneo hili?
   1= Kila siku
   2= Karibu kila baada ya siku mbili
   3=Kila wiki
   4= Kila mwezi

**SEHEMU YA TATU: SABABU KUU ZINAZO SABABISHA AJALI ZA BODABODA**

10. Kulingana na maoni yako, je unafikiri ajali nyingi za bodadoda hutokea wapi?
    1= Katika barabara za mijini
    2= Barabarani mitaani
    3= Hutokea kila mahali

11. Je kuna sehemu hatari ambapo ajali hutokea sana?
    1= Ndiyo
    0= Hapana

12. Ikiwa ndiyo ni maeneo gani yanayokusudiwa kuwa hatari?

    _____

    _____

    _____

13. Je unahisi ajali za bodaboda husababishwa na nini?
    1= Mwendo wa kasi
    2= Barabara mbovu/Barabara mbaya
    3= Ulevi.
    4= Makutano hatari ya barabara.
    5= Ukosefu wa uzoefu wa uendeshaji.
    6= Hali ya hewa.
    7= Upuuzaji wa sheria za barabarani.

14. Je una kofia ya chuma?
    1= Ndiyo
    0= Hapana

15. Ikiwa ndiyo, unaitumia mara ngapi?
    1= Sijawahi
    2= Mara kwa mara/Mara chache katika wiki

3= Kila siku

16. Je unamiliki kofia ya chuma ya abiria?
    1= Ndiyo
    0= Hapana

17. Je wewe huvaa jaketi ya kuonekana mara ngapi?
    1= Sijawahi
    2= Mara kwa mara/Mara chache katika wiki
    3= Kila siku

18. Je wewe huwa na abiria Zaidi ya mmoja kwenye bodaboda?
    1= Ndiyo
    0= Hapana

19. Umewahi kuendesha bodaboda yako ukiwa mlevi?
    1= Ndiyo
    0= Hapana

20. Je una cheti ambacho kinatambulika kwa uendeshaji wa bodaboda?
    1= Ndiyo
    0= Hapana

21. Je wewe huogopa kuhusika katika ajali barabarani?
    1= Ndiyo
    0= Hapana

22. Je ni wakati gani wewe hupata abiria wengi?
    1= Asubuhi
    2= Mchana
    3= Jioni
    4= Usiku

23. Kama dereva, unahisi ajali nyingi hutokea wakati gani?
    1= Asubuhi
    2= Mchana
    3= Jioni
    4= Usiku

Appendix C. Research Calendar

| | |
|---|---|
| April 5 | Print out 1 survey at SIT office, make 100 copies at a printing place in town, add theoretical and conceptual framework to proposal. Create excel document to collect survey data -> show this to Emily. |
| April 6 - 15 | Start collecting surveys on April 6 with goal of 20 surveys a day. I have added extra days for caution. This time will also be used to edit/modify the excel document and add survey information into the excel document. Survey results should be added daily into excel document. Also, the abstract will be written in this time. |
| April 16-17 | Editing excel document and reviewing data. Making graphs and charts of information to include in final draft. Possibly provide analysis of data/graphs if I have time |
| April 18-23 | Completing literature review and background. Editing proposal to make final paper -> changing tense from future to past. Adding any additional aspects of the final paper. |
| April 24-30 | Further analyzing data, making graphs, editing & finalizing paper. |
| May 1-2 | Creating Presentation. Practicing Presentation. |
| May 4 | Presenting research |

Appendix D.

SIT Study Abroad
a program of World Learning

**Statement of Ethics**
(adapted from the American Anthropological Association)

In the course of field study, complex relationships, misunderstandings, conflicts, and the need to make choices among apparently incompatible values are constantly generated. The fundamental responsibility of students is to anticipate such difficulties to the best of their ability and to resolve them in ways that are compatible with the principles stated here. If a student feels such resolution is impossible, or is unsure how to proceed, s/he should consult as immediately as possible with the Academic Director (AD) and/or Independent Study Project (ISP) Advisor and discontinue the field study until some resolution has been achieved. Failure to consult in cases which, in the opinion of the AD and ISP Advisor, could clearly have been anticipated, can result in disciplinary action as delineated in the "failure to comply" section of this document.

Students must respect, protect, and promote the rights and the welfare of all those affected by their work. The following general principles and guidelines are fundamental to ethical field study:

**I. Responsibility to people whose lives and cultures are studied**
Students' first responsibility is to those whose lives and cultures they study. Should conflicts of interest arise, the interests of these people take precedence over other considerations, including the success of the Independent Study Project (ISP) itself. Students must do everything in their power to protect the dignity and privacy of the people with whom they conduct field study.

The rights, interests, safety, and sensitivities of those who entrust information to students must be safeguarded. The right of those providing information to students either to remain anonymous or to receive recognition is to be respected and defended. It is the responsibility of students to make every effort to determine the preferences of those providing information and to comply with their wishes. It should be made clear to anyone providing information that despite the students' best intentions and efforts, anonymity may be compromised or recognition fail to materialize. Students should not reveal the identity of groups or persons whose anonymity is protected through the use of pseudonyms.

Students must be candid from the outset in the communities where they work that they are students. The aims of their Independent Study Projects should be clearly communicated to those among whom they work.

Students must acknowledge the help and services they receive. They must recognize their obligation to reciprocate in appropriate ways.

To the best of their ability, students have an obligation to assess both the positive and negative consequences of their field study. They should inform individuals and groups likely to be affected of any possible consequences relevant to them that they anticipate.

Students must take into account and, where relevant and to the best of their ability, make explicit the extent to which their own personal and cultural values affect their field study.

Students must not represent as their own work, either in speaking or writing, materials or ideas directly taken from other sources. They must give full credit in speaking or writing to all those who have contributed to their work.

**II. Responsibilities to Hosts**

Students should be honest and candid in all dealings with their own institutions and with host institutions. They should ascertain that they will not be required to compromise either their responsibilities or ethics as a condition of permission to engage in field study. They will return a copy of their study to the institution sponsoring them and to the community that hosted them at the discretion of the institution(s) and/or community involved.

**III. Failure to comply**

When SIT Study Abroad determines that a student has violated SIT's statement of ethics, the student will be subject to disciplinary action, up to and including dismissal from the program.

I, Rowan Poehler, have read the above Statement of Ethics and agree to make every effort to comply with its provisions.

Date: 3-11-2019

Appendix E.

SIT Study Abroad
a program of World Learning

**CONSENT FORM**

1. **Brief description of the purpose of this study**

   The purpose of this study is to research and better understand motorbike-related injuries and safety practices of motorbike drivers in Kisumu, Kenya

2. **Rights Notice**

   In an endeavor to uphold the ethical standards of all SIT ISP proposals, this study has been reviewed and approved by a Local Review Board or SIT Institutional Review Board. If at any time, you feel that you are at risk or exposed to unreasonable harm, you may terminate and stop the interview. Please take some time to carefully read the statements provided below.

   a. ***Privacy*** - all information you present in this interview may be recorded and safeguarded. If you do not want the information recorded, you need to let the interviewer know.

   b. ***Anonymity*** - all names in this study will be kept anonymous unless the participant chooses otherwise.

   c. ***Confidentiality*** - all names will remain completely confidential and fully protected by the interviewer. By signing below, you give the interviewer full responsibility to uphold this contract and its contents. The interviewer will also sign a copy of this contract and give it to the participant.

___Nashon Onyango _____
Participant's name printed

_____
Participant's signature and date

_Rowan Poehler _____
Interviewer's name printed

Rowan Poehler ___
Interviewer's signature and date